

AMENDMENTS TO THE CLAIMS

Please amend the Claim as follows. Insertions are shown underlined while deletions are ~~struck through~~. Please cancel Claims 7 and 11 and add Claims 14 and 15.

1 (currently amended): A conductive adhesive consisting of a conductive medium and
~~comprising metal powder as a conductive medium and only a one-component epoxy~~
~~thermosetting resin composition as a binder resin component,~~

wherein the conductive medium is metal powder, and the binder resin component is a
one-component epoxy thermosetting resin composition,

the conductive adhesive is a dispersion in which the metal powder is dispersed in said
one-component epoxy thermosetting resin composition with a content ratio of the metal powder
to the binder resin component in terms of volume ration being selected within a range between
34:66 and 55:45,

the metal powder is silver powder or mixed metal powder comprising silver powder
mixed with a small quantity of other metal powder,

wherein the ratio of the silver powder to the entire metal powder is selected to be at least
within the range of 70% or more in a volume ratio,

said one-component epoxy thermosetting resin composition is a composition comprising
~~only epoxy thermosetting resin as a resin component therefor, which composition is a liquid~~
~~composition comprising, as essential components~~ essentially consisting of:

(a) an epoxy resin component containing at least a multifunctional epoxy compound having a
polycyclic aromatic ring skeleton as a main component therein, and

(b) a cyclic acid anhydride having an acid anhydride moiety constituting a ring structure in
the molecule as a curing agent for the epoxy resin component,

(c) a cure accelerator,

(d) additive components, and

(e) a diluting solvent,

in a ratio of 0.7 to 1.1 equivalents of the cyclic acid anhydride of the curing agent (b) with
respect to the epoxy equivalent of the epoxy resin component (a),

~~the adhesive is a dispersion in which the metal powder is dispersed in said one-~~
~~component epoxy thermosetting resin composition with a content ratio of the metal powder to the~~

~~binder-resin component (metal:resin volume ratio) being selected within a range between 34:66 and 55:35,~~

wherein the epoxy resin component is a mixture of two or more multifunctional epoxy compounds being selected from a group consisting of bifunctional epoxy compounds and trifunctional epoxy compounds, in which mixture the ratio of the bifunctional epoxy compound to the trifunctional epoxy compound in the ratio of the number of molecules is selected to be within the range between 100:0 and 70:30,

the mixture of two or more multifunctional epoxy compounds is a combination of a multifunctional epoxy compound having a polycyclic aromatic ring skeleton and a multifunctional epoxy compound having a ring structure other than polycyclic aromatic ring in the skeleton, in which combination the mole ratio of the multifunctional epoxy compound having the polycyclic aromatic ring skeleton to the multifunctional epoxy compound having the other ring structure in the skeleton is selected to be within the range between 95:5 and 70:30,

wherein the mixture of two or more multifunctional epoxy compounds consists of two or more multifunctional epoxy compounds selected from a group consisting of multifunctional epoxy compounds having a bicyclic aromatic condensed ring skeleton, multifunctional epoxy compounds having a tricyclic aromatic condensed ring skeleton, and multifunctional epoxy compound having a ring structure other than polycyclic aromatic condensed ring in skeleton,

the mixture of two or more multifunctional epoxy compounds comprises at least a bifunctional epoxy compound in the form of dihydroxynaphthalene diglycidyl ether,

the curing agent is a cyclic acid anhydride having an acid anhydride moiety constituting a ring structure in the molecule,

the amount of the cyclic acid anhydride is selected in a ratio of 0.7 to 1.1 equivalents with respect to the epoxy equivalent of the epoxy resin component,

wherein said cyclic acid anhydride having an acid anhydride moiety constituting a ring structure in the molecule is a cyclic acid anhydride having another hydrocarbon ring skeleton fused with the ring structure constituted by the acid anhydride moiety, in which

said another hydrocarbon ring skeleton that is fused with the ring structure constituted by the acid anhydride moiety is a structure in which two or more chain-formlike hydrocarbon groups

are substituted on the ring, or a polycyclic structure having ~~cross-link~~bridge-chains on the ring, and

the total number of carbon atoms composing the structure of said another hydrocarbon ring skeleton including the chain-~~type~~form hydrocarbon groups is selected in the range of 8 to 18 or more.

the diluting solvent is a solvent having a high boiling point, and

an adherence imparting agent is added as the additive component.

2 (currently amended): The conductive adhesive as claimed in claim 1, ~~characterized in that said one-component epoxy thermosetting resin composition is added with~~

wherein a silane coupling agent is used as thean adherence imparting agent to improve the adherence between the resin and a metal surface forming junction.

3 (currently amended): The conductive adhesive as claimed in claim 1, ~~characterized by comprising~~

~~at least wherein at the bifunctional epoxy compound containing a naphthalene skeleton as one of said multifunctional epoxy compounds having a polycyclic aromatic ring skeleton that is a main component of the epoxy resin component (a) in the form of dihydroxynaphthalene diglycidyl ether is 1,6- dihydroxynaphthalene diglycidyl ether.~~

4 (currently amended): The conductive adhesive as claimed in claim 1, ~~characterized by comprising~~wherein the content ratio of the bifunctional epoxy compound in the form of

at least dihydroxynaphthalene diglycidyl ether as said bifunctional epoxy compound containing a naphthalene skeleton to other epoxy compounds is 3:1 in the weight ratio.

5 (currently amended): The conductive adhesive as claimed in claim 1, ~~characterized in that said one-component epoxy thermosetting resin composition further comprising;~~

~~(e) a wherein the cure accelerator having a function to accelerate heat curing reaction by the cyclic acid anhydride of the curing agent (b), is an imidazole based cure accelerator, and~~

the amount of the cure accelerator (e) to be added thereto is selected to be within the range of a catalytic quantity to the epoxy resin component (a) 0.012 to 0.047 moles of the imidazole based cure accelerator molecules per epoxy equivalent of the epoxy resin compound.

6 (currently amended): The conductive adhesive as claimed in claim 1, ~~characterized in that said~~ wherein the amount of the cyclic acid anhydride of the curing agent (b) is a cyclic acid

~~anhydride in which the ring structure constituted by said acid anhydride moiety is a 5-member or 6-member ring, and~~

~~another hydrocarbon ring skeleton is condensed with the ring structure constituted by the acid anhydride moiety; and~~

~~said another hydrocarbon ring skeleton that is fused with the ring structure constituted by the acid anhydride moiety is a structure in which two or more chain-like hydrocarbon groups are substituted on the ring, or a polycyclic structure having cross link chains on the ring,~~

~~wherein the total number of carbon atoms composing the structure of said another hydrocarbon ring skeleton including the chain-type hydrocarbon groups is 8 or more is selected in a ratio of 0.8 to 0.95 equivalents with respect to the epoxy equivalent of the epoxy resin component.~~

7 (canceled):

8 (currently amended): The conductive adhesive as claimed in claim 2, characterized by ~~further comprising a~~ wherein the silane coupling agent as said coupling agent is selected from γ -glicidoxypropyl-trimethoxy silane or γ -glicidoxypropyl-methylidethoxy silane.

9 (currently amended): The conductive adhesive as claimed in claim 1, characterized in ~~that~~ wherein the metal powder is silver powder or mixed metal powder formed by mixing a small quantity of other metal powder to silver powder, and the ratio of the silver powder to the entire metal powder is selected to be at least within the range of 90% or more in a volume ratio.

10 (currently amended): The conductive adhesive as claimed in claim 1, characterized in ~~that~~ wherein in the case that said metal powder is mixed metal powder comprising silver powder mixed with a small quantity of other metal powder,

said other metal powder that is mixed with silver powder is chosen from ~~cupper~~ copper powder or zinc powder.

11 (canceled):

12 (currently amended): The conductive adhesive as claimed in claim 1, characterized in ~~that as~~ wherein said multifunctional epoxy compound having other ring structures in the skeleton used in combination is selected from a bifunctional epoxy resin having a bisphenol A-type epoxy resin or skeleton or a multifunctional epoxy resin containing a dicyclopentadiene-type epoxy resin is employed skeleton.

13 (currently amended): The conductive adhesive as claimed in claim 2, characterized by ~~comprising at least a~~ wherein the bifunctional epoxy compound containing a naphthalene skeleton ~~as one of said multifunctional epoxy compounds having a polycyclic aromatic ring skeleton that is a main component of the epoxy resin component (a) in the form of~~ dyhydroxynaphthalene diglycidyl ether is 1,6-dyhydroxynaphthalene diglycidyl ether.

14(new): The conductive adhesive as claimed in claim 4,

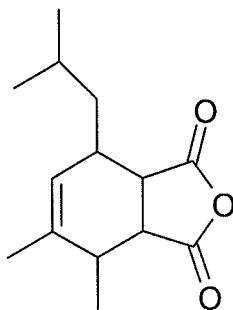
wherein the other epoxy compounds is selected from a group consisting of a trihydroxyanthracene triglycidyl ether, a bifunctional epoxy resin having a bisphenol A skeleton and a multifunctional epoxy resin containing a dicyclopentadiene skeleton.

15(new): The conductive adhesive as claimed in claim 1,

wherein said cyclic acid anhydride is selected from the following terpene-modified maleic anhydrides of Chemical formula 1 or 2:

[Chemical formula 1]

Epicure YH-306:



[Chemical formula 2]

Epicure YH-307:

